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GUIDELINES AND SUGGESTED TITLE LIST FOR UNDERGRADUATE CHEMISTRY LIBRARIES, A REPORT OF A.C.C.C. PANEL MEETINGS ON GUIDELINES FOR BOOKLISTS AND LIBRARY DEVELOPMENT (WASHINGTON, D.C., FEBRUARY 1965).

BY- LIPPINCOTT, W.T. AND OTHERS
ADVISORY COUNCIL ON COLL. CHEMISTRY

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MINIMUM HOLDINGS FOR AN UNDERGRADUATE COLLEGE CHEMISTRY LIBRARY ARE SUGGESTED BY THE ADVISORY COUNCIL ON COLLEGE CHEMISTRY. THE TITLE LIST PRESENTED IN THIS DOCUMENT IS RECOMMENDED FOR PLANNING NEW LIBRARIES, NOT AS A CHECK LIST FOR THOSE ALREADY ESTABLISHED. ITEMS INCLUDED WERE SELECTED BY A COMMITTEE AND REVIEWED BY OUTSTANDING COLLEGE CHEMISTRY TEACHERS AND RESEARCHERS. INTRODUCTORY SECTIONS PROVIDE INFORMATION ABOUT (1) LIBRARY ORGANIZATION, (2) ACQUISITION OF BOOKS AND PERIODICALS, (3) INTERLIBRARY LOANS AND PHOTOREPRODUCTION, (4) LIBRARIANS, AND (5) SOURCES OF INFORMATION RELATED TO MATERIALS ACQUISITION. THE REMAINDER OF THE VOLUME IS DEVOTED TO LISTS OF (1) JOURNALS AND ABSTRACTS, (2) REVIEW SERIALS, (3) FOREIGN LANGUAGE TITLES, (4) GOVERNMENT PUBLICATIONS, AND (5) TEXTBOOKS. ITEMS ARE GENERALLY LISTED ALPHABETICALLY BY TITLE OR AUTHOR AND INCLUDE COMPLETE CITATIONS AND PRICES. LISTINGS IN SEVERAL SECTIONS INCLUDE BRIEF DESCRIPTIONS. (AG)

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Guidelines and Suggested Title List for Undergraduate Chemistry Libraries

A Report Prepared by the

COMMITTEE ON TEACHING AIDS

of the

ADVISORY COUNCIL ON COLLEGE CHEMISTRY

SE002 194

(Serial Publication 12)

Guidelines and Recommended Title List

for

Undergraduate Chemistry Libraries

A Report of A.C.C.C. Panel Meetings

on

Guidelines for Booklists and Library Development

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Washington, D. C.
February 1965

Crawfordsville, Indiana
October 1965

This report of the Committee on Teaching Aids of the Advisory Council on College Chemistry is one of a series designed to aid in improving the teaching of college chemistry. The activities of the Council are supported by a grant from the National Science Foundation, Washington, D. C. The A.C.C.C. welcomes constructive comments, suggestions and criticisms. These should be directed to the committee chairman, Professor W. T. Lippincott, Department of Chemistry, Ohio State University, Columbus, Ohio 43210.

All persons on the Council "Newsletter" mailing list are being sent copies of this report. A limited number of additional copies are available free of charge from:

William B. Cook, Executive Secretary
Advisory Council on College Chemistry
Department of Chemistry
Stanford University
Stanford, California 94305

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ADVISORY COUNCIL ON COLLEGE CHEMISTRY

TEACHING AIDS COMMITTEE

Members 1964-65

HAENISCH, Prof. Edward L., Dept. of Chemistry, Wabash College, Crawfordsville, Ind.
KIEFFER, Prof. William F., Dept. of Chemistry, College of Wooster, Wooster, Ohio
YOUNG, Prof. Jay A., Dept. of Chemistry, King's College, Wilkes-Barre, Pa.
HENZE, Dr. Robert E., (Chairman) American Chemical Society, Wash., D. C.

PANEL MEETING ON GUIDELINES FOR BOOK LISTS AND LIBRARY DEVELOPMENT
Washington, D. C., February 25-26, 1965

Participants

BAUER, Dr. William E., Associate Editor, Advisory Council on College Chemistry, 1964-65.
BELKNAP, Richard H., American Chemical Society, Washington, D. C.
BRASTED, Prof. Robert, Dept. of Chemistry, University of Minnesota, Minneapolis, Minn.
HENZE, Dr. Robert E. (see above)
HERZ, Dr. Werner, Dept. of Chemistry, Florida State University, Tallahassee, Florida
KEENAN, Miss Stella, Documentation Research Project, American Institute of Physics, New York, N. Y.
LEE, Mrs. Beverly, Chemistry Dept. Library, University of Minnesota, Minneapolis, Minn.
MELLON, Prof. Melvin G., Dept. of Chemistry, Purdue University, Lafayette, Ind.
POWER, Miss Ruth T., Dept. of Chemistry and Chemical Engineering Library, University of Illinois, Urbana, Ill.
PRICE, Prof. Charles C., Dept. of Chemistry, University of Pennsylvania, Philadelphia, Pa.
SCHUBERT, Prof. Leo, Dept. of Chemistry, The American University, Washington, D. C.
YOUNG, Prof. Jay A. (see above)

Observer

MAYS, Dr. John M., National Science Foundation, Washington, D. C.

SPECIAL PANEL MEETING TO REVIEW GUIDELINES AND TO PREPARE TITLE LIST FROM RESULTS OF POLL OF DEPARTMENTS AND SPECIALISTS
Crawfordsville, Indiana, Oct. 31 - Nov. 1, 1965

Participants

BERGEN, Donald H., Assistant Editor, Advisory Council on College Chemistry, 1965-66.
BRASTED, Prof. Robert (see above)
HAENISCH, Prof. Edward L. (see above)
HENZE, Dr. Robert E. (see above)
LIPPINCOTT, Prof. William T., Dept. of Chemistry, The Ohio State University, Columbus, Ohio. (Chairman Teaching Aids Committee, 1965-)
MELLON, Prof. Melvin G. (see above)
POWER, Miss Ruth T. (see above)
YOUNG, Prof. Jay A. (see above)

(The Editor gratefully acknowledges the work of Miss Ruth T. Power and the staff of the University of Illinois Chemistry Library in the preparation of the bibliographic detail of the suggested title list.)

I. INTRODUCTION

Over the past two years numerous requests have been made to the Committee on Teaching Aids of the Advisory Council on College Chemistry for a list of desirable holdings for an undergraduate chemistry library. In response to these requests and in recognition of the growing problem faced by chemistry departments in the smaller colleges and universities in developing and maintaining an adequate chemistry library, the Advisory Council on College Chemistry authorized the development of this report.

The "guidelines" presented here have been prepared in an attempt to assist librarians and faculty library committees plan a wise and orderly schedule of acquisition. It is hoped that they will be helpful in selecting chemistry library holdings beyond those suggested in the recommended title list.

In no sense is the recommended title list an attempt to present a complete list of chemistry titles useful at the undergraduate level. Many excellent works do not appear on this list. The list suggests minimum holdings to meet the general reading and reference needs of undergraduate students and teachers. Even though their library budget might be quite small, it is expected that departments will *expand* this basic collection both in breadth and depth to meet specific course requirements and special research interests of students and faculty. The list suggested here should serve as a "guide" for new and developing chemistry libraries, rather than a "check list" for an established library. The list has been purposely kept as small as possible and commensurate with the budgets of smaller institutions.

A preliminary list of approximately eleven-hundred titles and journals was prepared by the Committee and was circulated for comments and additions to the list. Title lists were commented on by fifty professors of national reputation in both teaching and research as well as thirty college chemistry department faculties. These results were tabulated and carefully examined by the Special Panel which met at Wabash Colleg The University of California, San Diego, New Campuses Program Chemistry List and the American Chemical Society Committee on Professional Training List were also reviewed by the Special Panel in order to make the title list as complete as possible. The decision as to which titles and journals would be placed on the final list was made by the Special Panel.

In preparing this report the AC₃ Committee on Teaching Aids recognized that errors of both omission and commission were probably inevitable—to correct these in future revisions and supplements we welcome suggestions from readers. Please direct your comments to:

Dr. W. T. Lippincott, Chairman
AC₃ Committee on Teaching Aids
Department of Chemistry
The Ohio State University
Columbus, Ohio 43210

II. PRACTICAL LIBRARY CONSIDERATIONS

Organization

It can be argued that, more than any other single factor, the character of a chemistry department is demonstrated by the holdings on its library shelves and their accessibility to students and staff. For this reason the chemistry library should be considered a primary educational arm of the department. This library should be organized as a service unit and operated to meet the educational and research needs of students and faculty. To accomplish this end there should be close cooperation between library users and library staff. A faculty library committee advisory to the librarian is an effective means of achieving efficient solutions to use, need, and acquisition problems.

Preferably, the chemistry library should be in the chemistry building and books and journals easily accessible to students. Combined science libraries can have added advantages provided they are close to the science departments served. The library should be readily available for general reading and browsing, for assignment reference, and for laboratory research information.

Collection

A collection of basic books, reference works, and adequate journal holdings are essential for every chemistry library and should be integrated closely with the teaching program. To acquire an initial collection, a special fund might be requested. Since the improvement in microfilm readers makes film more acceptable to the user, the small library can provide on film materials at a nominal cost for research including back volumes of journals and reports.

The chemistry library collection can be strengthened by gifts of journals and books from faculty members. Often, chemists and chemical engineers in industrial positions are willing to donate their collections to the library when the needs of the library are made known to them. A wide variety of interesting and attractive "house organs" are available without cost from industrial companies.

Acquisition Policy for Paperbound Books and Periodicals

Major determinants in the acquisition of any publication are the cost of acquiring, maintaining, and housing, rather than the initial list price. Almost identical costs are involved in acquisitions of pamphlets, paperbacks, hard cover books, and journals. The librarian must be guided by these costs in determining the acquisitions program.

Costs begin at the moment of order. The processing and placing of an order is a cost. The receipt, classification, and cataloging is yet another. Nor is the assumption of space on the shelf the final consideration. There may also be the maintenance cost of reenforcement or rebinding. It becomes obvious in many cases that initial cost of the volume is of relatively minor significance.

The hard cover versus paperback book decision can be best determined in accordance with the librarian's opinion of the potential extent of its use. Heavy circulation of a paperback, whose list price is low, will ultimately make that item more costly than the hard bound edition because of time and materials needed to maintain it in proper condition. This does not mean to suggest that the paperback has no place in the library.

The new or growing library will discover that many of the classics in chemical literature exist only in soft cover reprint form. Older libraries may have hard cover original editions, but the new library finds them available in soft cover reprint only. Paperbacks with their inherent disadvantages are still necessary for a complete collection in many cases. The book whose content is of interest to a limited number of patrons, or which is essentially ephemeral in nature may be considered for purchase in paperback form.

It is in the area of journal acquisition that costs are of major consideration to the librarian: the initial subscription and renewal cost, and binding and housing costs, and yet later possibly the cost of transfer to storage. It is important that the library have an ever increasing annual operating budget merely to

maintain the level of an existing collection. With the constant increase in subscription prices, plus increasing binding cost, it is one thing to maintain the collection level, and yet another to expand and improve the collection.

The "friend of the library," the distinguished alumnus who bequeaths his personal library or collection of bound journals to the library, may create an acquisitions problem. The local industrial research firms who provide specific "gift" subscriptions in an area of remote interest or ephemeral nature also affect the library budget.

The inference in these bequests is that the library is indeed fortunate in being the recipient, when in fact the library may become only a repository for a once useful collection whose sole function may now be the taking up of space and collecting of dust.

Interlibrary Loan and Photoreproduction

By means of interlibrary loan and photoduplication, the library with a small collection can more effectively serve its clientele. The American Library Association Interlibrary Loan Code should be consulted for the kind of materials proper to request on loan. The trend is toward microfilm or photoprint in lieu of the loan of the actual printed material. The standard interlibrary loan and photoduplication forms available from library supply companies are recommended. For prompt service, these forms should give all the bibliographical information that the borrower can furnish, especially source of reference. The *Chemical Abstracts* "List of Periodicals with Key to Library Files" is excellent for locating journal title holdings. The latest such list was issued by *Chemical Abstracts* in 1961. Supplements have been issued in 1962, 1963, 1964, and 1965. Reprints of the 1961 list and the supplements are available from the Special Issue Sales, American Chemical Society, 1155 Sixteenth St., N.W., Washington, D. C. 20036.

Pamphlet Files

Pamphlet files, an important part of a library's collection, can include such permanent materials as reprints, translations, and photo reproductions of journal articles as well as ephemeral materials of current interest, such as some government publications, industrial company brochures and publications, and publishers' and book dealers' catalogs. Reprints and translations are especially valuable to a library having only a small number of journals.

Review of Shelves

Periodic review of the shelves is necessary and desirable. Shift of some little used collections to less accessible but still available locale may free space for incoming and more frequently used titles.

Chemistry Librarian

When the collection warrants a departmental library, the librarian should have both the professional degree in library science and a good background or degree in chemistry. When a specially trained chemistry librarian is not available it is essential that a chemistry faculty member or chemistry faculty library committee be available to advise the general college librarian.

Not all of the competence in the use of the chemistry holdings can reside in the librarian—some minor competence on the part of the student must be demanded. The publication, "Searching the Chemical Literature", by M. G. Mellon, an inexpensive soft cover publication of the American Chemical Society is recommended for those students who will use the library.* By no means a complete discussion (it is only 40 pages), this publication introduces the student to the techniques needed for proper use of the chemistry library. Students who have read this work will be able to ask some intelligent questions as they seek the help of the ilbrarian in their studies.

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* Individual copies are obtainable at 75 cents each, but orders of ten (10) or more for teaching purposes sell at 25 cents per copy. Write to: Special Issue Sales, American Chemical Society, 1155 Sixteenth St., N.W., Washington, D. C. 20036.

III. ACQUISITION OF NEW TITLES

The Problem

The selection of new titles in chemistry poses a serious problem because of the flood of new books that appears each year. The problem becomes particularly acute for the smaller college with the more limited budget. Fortunately there are several ways in which a chemistry department, or a librarian acquiring chemical titles, may obtain information. The character of the undergraduate program in chemistry is all-important in determining policies leading to decisions as to which titles should be purchased. When the budget is small, the purchase of books for course-reserves should be given priority. It is obvious that in a college which does not graduate chemistry majors the acquisition of the more advanced treatise is likely not to be useful to the student population. The library dollar could much better be spent on books of more general interest. It is almost inevitable that titles will reflect research interest of the staff. However, judgment and restraint are in order to provide a wide coverage in subject matter.

It is a great temptation to purchase those books which will carry prestige because of their advanced nature. In the purchase of books, a prime prerequisite should always be student and staff utility. Books acquired but not used by students and faculty are a poor investment in education.

Sources of Information

The Association of College and Research Libraries, a division of the American Library Association, 50 East Huron Street, Chicago, Ill., 60611, publishes a monthly magazine, *Choice*. This magazine contains critical reviews of books from all of the fields in which a liberal arts college would normally be interested. The titles in chemistry are very few, but are annotated very well by very competent chemists. *Choice* is addressed to those libraries whose yearly budget is less than $20,000. While a department of chemistry should not be expected to subscribe to this magazine, it is very likely that the central library would. The department of chemistry should review the recommended titles rather than having the college librarian proceed automatically to purchase them.

The American Association for the Advancement of Science performs a unique function in its bibliographic services. The Association's "Science Book List for Young Adults",* prepared under the direction of Hilary J. Deason, and most recently published in 1964, contains approximately 1400 titles in mathematics and all of the fields of science. These titles are critically evaluated. They are, in general, suitable for students in junior high school through junior college. Because of the high caliber of the books listed, a department of chemistry is well advised to review these titles and determine whether or not it wishes them to be present in its own library. The books themselves may not be technical or sufficiently advanced, but they might prove to be of great value to students who are studying chemistry but who do not intend to become chemists.

A new publication of the AAAS, *Science Books: A Quarterly Review* (subscription cost is $4.50 per year), performs an even more valuable service. This quarterly contains critical reviews of books in all fields of science; they appear at about the time of publication of the book itself. Unlike *Choice* every department of chemistry should subscribe to this publication. Like the "Science Booklist for Young Adults" this quarterly is particularly valuable for the first two years of college. It does provide a list of books that will be especially tempting to the non-scientists.

The Council of Chief State School Officers provides a comparable service in its 1965 edition of the "Purchase Guide for Programs in Science and Mathematics". This purchase guide contains a bibliography of books in chemistry. These books are critically reviewed and the college teacher or librarian is well advised to review the titles and sources listed.

Other techniques are available to colleges that are able to spend larger sums of money for acquisitions

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* Available from AAAS Publications, 1515 Massachusetts Ave., N.W., Washington, D. C., 20005. $2.50 paper; $3.50 cloth. AAAS has also prepared a list of 900 paperbound science books which appears in *A Guide to Science Reading,* Signet Science Library Book (P 2283), The New American Library (1963), $0.60. (See section IX for address)

of titles in chemistry. One sound approach is to obtain advice from schools that have well established and good libraries. Some college libraries are automated and a print-out of their titles in chemistry is frequently available upon request. Inasmuch as these titles were selected by personnel in a chemistry department, it may be presumed that they are of higher caliber than unselected titles.

The most comprehensive current booklist in chemistry is that published annually in the September issue of the *Journal of Chemical Education.* No attempt is made in this journal to list the books critically. However, titles of the books listed there serve as a very convenient way for chemistry faculties to check off those titles that interest them. All books found in *Journal of Chemical Education* booklist are on exihibit at the fall national meeting of the American Chemical Society. Perusal of a book at this exihibit makes a more objective judgment possible.

The most valuable resource for evaluating books to purchase are the book reviews published in the various chemical journals. For general purposes the most important source of such reviews is the *Journal of Chemical Education.* However, each of the specialized journals also publishes reviews of books in its field. These signed reviews are usually authoritative and provide a convenient way to review the current chemical literature.

Librarians should regularly consult the "Cumulative Book Index". A directory of some of the more commonly cited publishers can be found in the *Chemical Abstracts'* "List of Periodicals" for 1961 and the supplements. *Technical Translations* and *Transatom Bulletin* are useful for locating translations.

For U. S. Government publications see Section VII.

For books in cognate fields, the "Check List of Books for an Undergraduate Physics Library" of the American Institute of Physics, 335 East 45th Street, New York, New York 10017, and the "Basic Library List" of the Committee on the Undergraduate Program in Mathematics, P.O. Box 1024, Berkeley, California 94701, should be consulted.

Cost

A very incomplete survey of cost data submitted by college libraries indicates a minimum expenditure of $3500-$5000 a year for chemistry periodicals, reference works, and other titles.

IV. JOURNALS AND ABSTRACTS

The extent of the need for current periodicals by libraries of liberal arts colleges, or institutions of higher learning whose primary function is *not* research, is open to considerable debate. A number of very basic issues are cogent to this phase of library development: (a) the extent to which the library serves in an instructional capacity; (b) the scope of the independent investigations in the curriculum work; (c) the importance which the administration attaches to research conducted by the senior staff; (d) the emphasis placed upon senior thesis research; and (e) the number of disciplines other than chemistry with legitimate claims for similar budget support for the acquisition of periodicals.

The Advisory Council bases its recommendations on the following assumptions: (a) the college offers a major in chemistry, hopefully, but not necessarily, approved by the American Chemical Society; (b) high caliber staff will be attracted only to a department whose library meets at least the basic needs for continuing professional growth; (c) the students at all levels should be encouraged to seek current information in their course work; and (d) some independent investigation is encouraged on the part of both student and staff.

The almost unending list of periodical titles makes a choice most difficult. Since total budgets for library acquisitions will vary widely from institution to institution, the problem becomes further complicated. For larger institutions the budget used for periodicals may be separate from the budget for single copy texts and references. Whatever the mechanisms, sufficient money must be available for continuing subscriptions once a choice is made. Single unindexed issues and short runs are of little long-range reference value.

It is recommended that the basic periodicals suggested be started without regard to the immediate availability of a complete or even partially complete back file. Too often a library delays initiating a periodical subscription because a complete collection is not available. Back issues may be obtained by one of several avenues: (a) purchase through existing agencies, unfortunately often at nearly prohibitive prices; (b) purchase or gift from an emeritus member of the staff or an industrial colleague; (c) advertising through alumni contact publications for either gifts of back issues or funds designated for this specific purpose.

Chemical Abstracts. As important a title as this periodical is, a number of factors must be considered before subscription is initiated. The cost is bordering on the prohibitive, yet staff as well as students in chemistry need this periodical as the one journal that will cover all chemistry disciplines. It is to be recognized that this source does not take the place of the specific periodicals, but at least general coverage of a topic and original sources can be obtained with the help of *Chemical Abstracts.* There would seem to be little advantage to a college library subscribing to selected sections of *Chemical Abstracts.* If no courses involving student research or independent study are included in the chemistry curriculum, and if no faculty members are carrying out chemical research, then the purchase of *Chemical Abstracts* is difficult to justify, and the sum that would be spent for this periodical could probably be better spent on other purchases in chemistry, or other areas. As independent study and student and faculty research develop *Chemical Abstracts* becomes essential and the $1200 (1965) annual cost must be provided for in the budget for chemistry. The value of *Chemical Abstracts* to students and faculty in biology, physics and other sciences should not be forgotten. Recent (1965) federal legislature (HEW) may provide some financial relief in the acquisition of this holding as well as others. The American Chemical Society has made special arrangements with colleges and universities who have been receiving *Chemical Abstracts* to subsidize part of the subscription price.

Suggested List

The suggested list of periodicals follows. Prices are for 1965-66. Addresses of publishers are in Section IX.

JOURNALS

**Analytical Chemistry.* Washington, American Chemical Society, 1929- monthly, A.C.S. members $4.00; all others $5.00

Angewandte Chemie (International edition in English). New York, Academic Press, 1962- monthly, $32.00 per vol.

Annalen der Chemie (Justus Liebigs). Weinheim/Bergstr., Verlag Chemie, 1832- irr., approx. $6.50 per vol.

**Biochemistry.* Washington, American Chemical Society, 1962- monthly, A.C.S. members $13.00; all others $26.00

Canadian Journal of Chemistry (formerly Canadian Journal of Research). Ottawa, National Research Council of Canada, 1929- semimonthly, annual subscription $12.00

**Chemical Abstracts.* Washington, American Chemical Society, 1907- biweekly, annual subscription $1200 (Colleges and universities are eligible for a grant of $500 toward the subscription price.)

**Chemical and Engineering News.* Washington, American Chemical Society, 1923- weekly, A.C.S. members free; all others $6.00

Chemical Communications. London, The Chemical Society, 1965-twice-monthly, £5 per annum

**Chemical Reviews.* Washington, American Chemical Society, 1924- bimonthly, A.C.S. members $10.00 all others $20.00

Chemische Berichte. Weinheim/Bergstr., Verlag Chemie, 1868- monthly, annual subscription approx. $59.40. (Until Feb. 1945 this Journal appeared as Berichte der Deutschen chemischen gesellschaft, Berlin. Publication was suspended from March 1945 to November 1946. Volumes 78-79 are omitted in the numbering.)

**Chemistry.* Washington, American Chemical Society, 1964- monthly, annual subscription $3.00

Discussions of the Faraday Society. Washington, Butterworth, 1947- normally published twice a year, price varies.

Endeavour. London, Imperial Chemical Industries, 1942- quarterly, free to senior scientists, scientific institutions and libraries throughout the world

Helvetica Chimica Acta. Basel, Verlag Helvetica Chimica Acta (Printed by Birkhauser, AG), 1918- approx. 9 nos. per year, annual subscription approx. $41.00

**Industrial and Engineering Chemistry.* Washington, American Chemical Society, 1909- monthly, (price varies with number of quarterlies) A.C.S. members $4.00- $10.00; all others $5.00 - $12.00

**Inorganic Chemistry.* Washington, American Chemical Society, 1962- monthly. A.C.S. members $11.00; all others $22.00

Journal of Biological Chemistry. Baltimore, American Society of Biological Chemists, 1905- semimonthly, annual subscription $45.00

Journal of Chemical Education. Easton, Pa., Chemical Education Publishing Co., American Chemical Society, 1924- monthly, annual subscription $4.00

Journal of Chemical Physics. New York, American Institute of Physics, 1933- semimonthly, annual subscription $35.00

Journal of Inorganic and Nuclear Chemistry. New York, Pergamon Press, 1955- monthly, annual subscription $120.00, U.S.A.; personal subscriptions, $15.00, U.S.A.

**Journal of Organic Chemistry.* Washington, American Chemical Society, 1936- monthly, A.C.S. members $12.50; all others $25.00

**Journal of Physical Chemistry.* Washington, American Chemical Society, 1896- monthly, A.C.S. members $12.00; all others $24.00

**Journal of the American Chemical Society.* Washington, American Chemical Society, 1879- semimonthly, A.C.S. members $13.00; all others $26.00

Journal of the Chemical Society (London). London, The Chemical Society, 1848- monthly, annual

subscription £46 (January, 1966 the JOURNAL was divided into three sections: Journal of the Chemical Society: inorganic, physical, and theoretical, £12; Journal of the Chemical Society: physical organic, £9; Journal of the Chemical Society: organic, £24)

Nature. London, Macmillan (Journals) Ltd., 1869- weekly, annual subscription: inland £14; overseas £13 15s.

Quarterly Reviews. London, The Chemical Society, 1947- quarterly, £2 per annum

Science. Washington, American Association for the Advancement of Science, 1895- weekly, annual subscription $8.50

Scientific American. New York, Scientific American, Inc., new series 1948- monthly, annual subscription $7.00

Tetrahedron. New York, Pergamon Press, 1957- monthly, $150.00 per annum for libraries; $15.00 per annum for personal subscription

Tetrahedron Letters. New York, Pergamon Press, 1959- weekly, U.S.A.: $100.00 per annum for libraries; $10.00 per annum for personal subscriptions

Transactions of the Faraday Society. Washington, Butterworth, 1905- monthly, price varies.

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* There is an additional charge for mailing to foreign countries.

V. REVIEW SERIALS

Many excellent "summary" reviews of progress in the various fields of chemistry are currently available. Periodicals of this type provide authoritative discussions of significant developments and advances made over a given time period and generally include references to the more important research papers contributing to progress in the field reviewed. Some review series cover broad areas, others realtively specialized fields; some represent reviews of the current research literature, others collections of symposium or conference papers.

The selection of review serials especially appropriate to the undergraduate chemistry library is difficult and entails many of the same considerations that apply to the selections of journals and abstracts. Three covering chemistry in broad scope are:

Annual Reports of the Chemical Society (London)
Chemical Reviews (See Journal listing)
Quarterly Reviews (London) (See Journal listing)

Depending on the special interests of staff and advanced students and the availability of funds, the addition of review serials covering the several basic branches of chemistry more specifically should be considered. Several among the following examples are included in the suggested title list:

Advances in Analytical Chemistry and Instrumentation
Annual Review of Biochemistry
Reviews of Pure and Applied Chemistry (Australia)
Advances in Inorganic Chemistry and Radiochemistry
Progress in Inorganic Chemistry
Advances in Organic Chemistry: Methods and Results
Advances in Physical Organic Chemistry
Progress in Organic Chemistry
Progress in Physical Organic Chemistry
Annual Review of Physical Chemistry

Excellent review serials dealing with more specific areas within the several branches of chemistry are also available. Examples of these include:

Nutrition Reviews
Advances in Spectroscopy
Chromatographic Reviews
Advances in Enzymology and Related Subjects of Biochemistry
Advances in Protein Chemistry
Ergebnisse der Vitamin- und Hormonforschung
Progress in Nucleic Acid Research and Molecular Biology
Advances in Heterocyclic Chemistry
Annual Review of Nuclear Science
Progress in Reaction Kinetics
Annual Review of Petroleum Technology
Advances in Quantum Chemistry
Advances in Lipid Research
Advances in Organometallic Chemistry

References to other review serials may be found in "Index to Reviews, Symposia Volumes, and Monographs in Organic Chemistry", by Kharasch, Wolf, and Harrison.*

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* Kharasch, Norman, Walter Wolf and Elaine C. P. Harrison, eds. Index to reviews, symposia volumes and monographs in organic chemistry for the period 1940-1960. New York, Pergamon Press, 1962 (016) $15.00 (Kept up to date by supplementary volumes)

Kharasch, Norman and Walter Wolf, eds. Index to reviews, symposia volumes and monographs for the period 1961-1962. New York, Pergamon Press, 1964 (016) $10.00 (For publisher's address see Section IX.)

Valuable review articles are also found in regular or special issues of research journals. An example of the latter is the special "annual progress" issue of *Analytical Chemistry.* Another example is the publication of meeting symposium papers in the *Journal of Chemical Education.* Still another source of organized reports on current progress in the various fields of chemistry are the abstracts of papers presented at scientific meetings. Arrangements might be made to secure these volumes from participating faculty members. The American Chemical Society publishes an "Advances in Chemistry Series". Each volume is a collection of symposium papers on current, specialized topics.

After the acquisition of a few review serials covering a wide range of chemical interests, expansion of this area of the undergraduate chemistry library requires a careful balancing of the special needs of the faculty and advanced students against available funds and needs for journals, monographs and general reference works. It should be remembered that with appropriate journals, index serials, and abstracting journals at hand one can develop his own review of progress.

VI. FOREIGN LANGUAGE TITLES

While a considerable fraction of the world's chemical literature is published in English or is available in translation (at prices which are beyond the means of most college libraries), it is considered good practice to expose the undergraduate chemistry major to at least some journal articles and books written in a foreign language. It is felt that even if the student's senior research problem does not require this, some familiarity with foreign publications is highly desirable in order to prepare him for a successful career in science.

A very helpful book to improve the facility in chemical German is "Englische und Deutsche chemische Fachausdrucke; Ein Leitfaden der Chemie in englischer und deutscher Sprache" (German-English Chemical Terminology; An Introduction to Chemistry in English and German).* Recently revised, this book has both English and German texts printed side by side on opposite pages. The coverage of topics is modern. The subject index has more than 10,000 entries.

The choice of foreign language journals for the chemistry library will depend largely on the interests of the faculty, and no single publication can be specified as being most important.

Some familiarity with a foreign language is of course essential for the use of such standard reference works as "Beilstein", "Landolt-Börnstein", "Gmelin", and other comprehensive treatises.

Unfortunately, the last three mentioned series represent unusually costly multiple volume offerings. Each has more of a bearing on the research orientation of the science departments than the usual teaching functions. As is the case with *Chemical Abstracts,* the library funds budgeted for purchase and continuation of research-oriented subject matter will dictate the possibility of adding these titles to the collection. Some pertinent facts are given on the collections as an aid to departments and to librarians. There is no question but that the total amount needed for all volumes could perhaps be better spent to bolster neglected areas or fields in which the subject matter is expanding rapidly.

A complete set of "Beilsteins Handbuch der organischen Chemie" (4. Aufl.) is available from Springer-Verlag, New York, Inc., 175 Fifth Avenue, New York 10070 for the sum of $5,885.00 (1965). The set at this price would (as of this date) be updated to the third supplement, Volume V, Part 4, April 1965.

The "Gmelins Handbuch der anorganischen Chemie" (8. Aufl.) is under constant preparation by the Gmelin Institute, a member organization of the Max Planck Society for the Advancement of Science. A complete set is available from Walter J. Johnson, 111 Fifth Avenue, New York, New York 10010 for $10,907.00. There are 170 parts and 47,948 pages as of April 1965. Where special interests are desired, it is possible to buy selected volumes of "Gmelin." Such is not possible for "Beilstein." The panel responsible for this basic title list has stressed the concept of broad coverage of chemistry as opposed to narrower discipline specialty titles. Certainly both "Beilstein" and "Gmelin" would represent heavy financial committment of special areas.

The third title, "Landolt-Börnstein, Zahlenwerte and Funktionen aus Physik, Chemie, Astronomie, Geophysik und Technik" (6. Aufl.) 1950-1957, is broader in field coverage but narrower in scope since the content is essentially numerical constants, technological and physical data. In the liberal arts college library (in chemistry) there is less justification for this collection than the "Gmelin" or "Beilstein." The panel does not, in such a statement, minimize the importance of this title. The volumes (parts) of the sixth edition of concern to science departments are listed with costs from Springer-Verlag, Stechert-Hafner, Inc., 31 East 10th Street, New York, N. Y., 10003.

Vol. I:	Atoms and Molecular Physics Five Parts (in periods of 1950-52)	$244.50

* Fromherz, Hans and Alexander King. Englische und deutsche chemische Fachausdrucke; ein Leitfaden der chemie in englischer and deutscher Sprache. 4., neubearb. und erweiterte Aufl. Weinheim/Bergstr., Verlag Chemie, 1963 $12.00 (Dewey 438). (For publisher's address see Sect. IX.)

Vol. II:	Properties of Materials in Their States of Aggregation Nine Parts (in period of 1956-63)	973.88
Vol. III:	Astronomy and Geophysics A single part (1952)	62.00
Vol. IV:	Technological Three Parts	550.00

A new series "Landolt/Börnstein: Zahlenwerte und Funktionen aus Naturwissenschaften und Technik," New York, Springer-Verlag started to appear in 1961. Published as of December 1965 were:

Group I: Nuclear Physics and Technology
Vol. I. Energy Levels of Nuclei: A = 5 to A = 257 (1961)
Group II: Atomic and Molecular Physics
Vol. I. Magnetic Properties of Free Radicals (1965)
Group VI: Astronomy, Astrophysics and Space Research
Vol. I. Astronomy and Astrophysics (1965)

Expansion beyond the journals listed in Section IV might include *any* of the following:

Bulletin de la Societe Chimique de France.
Bulletin of the Chemical Society of Japan (Printed in English).
Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences.

One and preferably more of the following:

Russian Journal of Inorganic Chemistry (*English Translation* of Zhurnal Neorganicheskoi Khimii).
Russian Journal of Physical Chemistry (*English Translation* of Zhurnal Fizicheskoi Khimii).
The Journal of Analytical Chemistry, USSR (*English Translation* of Zhurnal Analiticheskoi Khimii).
Journal of General Chemistry, USSR (*English Translation* of Zhurnal Obshchei Khimii).
One or more of the *Izvestia Akademii Nauk Series* in Russian.
Recueil des Travaux Chimiques des Pays-Bas.
The Journal of the Indian Chemical Society.

One or more of the various *Zeitschrifts:*

Zeitschrift für analytische Chemie.
Zeitschrift für anorganischen und allgemeine Chemie.
Zeitschrift für physikalische Chemie.

There is no significance to the order in which the above are listed.

VII. U. S. GOVERNMENT PUBLICATIONS

The various governmental units in many countries issue a very large number of technical publications. Many of these documents are of concern to chemists and chemical engineers. Only those of the United States can be considered here, and the discussion is limited to Federal publications.

There are two very distinct types of these publications: (1) patents, which are issued by the United States Patent Office; and (2) bulletins (under various names), which are issued by a number of subdivisions of the government. These are treated separately.

Patents

In the opinion of many industrial chemists and chemical engineers, patents, more than any other kind of publication, reveal the expanding frontiers of applied science. This includes chemistry, for which some 25,000 patents are currently abstracted each year by *Chemical Abstracts.*

As defined by the U. S. Patent Office, these patents cover (1) machines, (2) processes, and (3) compositions of matter. They must have novelty and must be described in sufficient detail to enable one skilled in the art involved to make or use the invention described.

Usually the description, and accompanying claims, are so detailed and involved in legal verbiage that an abstract of much value is nearly impossible. A copy of the patent must be examined for these details.

A very small library might have a few books about patents, such as the following:

Forman, H. I. (ed.): "Patents, Research, and Management," Central Book Company, New York, 1961. This book contains an annotated bibliography of 93 publications.

Naimark, G. M.: "A Patent Manual for Scientists and Engineers," Charles C. Thomas, Publisher, Springfield, Ill., 1961.

"Patents for Chemical Inventions; Symposia sponsored by the Division of Chemical Literature and the Division of Industrial and Engineering Chemistry at the 145th Meeting of the American Chemical Society, New York, N. Y., September 9 and 13, 1963," Washington, American Chemical Society, 1964. (Advances in Chemistry Series, No. 46)

Thomas, E.: "Chemical Inventions and Chemical Patents," M. A. Auslander (ed.), Clark Boardman Company, New York, 1964.

These books indicate the general nature of patents as literature. Along with them there might be assembled a small collection of chemical patents to illustrate the three kinds which are of interest to chemists. They would also serve to illustrate the intricacies of patent descriptions and claims.

Student interest may be generated by having each one select from *Chemical Abstracts* a United States patent of interest and send for a copy to the Commissioner of Patents, Washington, D. C. 20231. They cost 50 cents each. Further details, as well as information about foreign patents are found in the front of each issue of *Chemical Abstracts.*

Public Documents

A dozen or more subdivisions of the Federal government issue a vast number of scientific publications. Many of these have chemical interest. Their nature varies from mere statistical compilations, such as the analyses of Indiana coals, to very sophisticated technical bulletins.

Among the more important bureaus and agencies issuing such publications are the following:

Department of Agriculture:
- Agricultural Research Service
- Forest Service

Department of Commerce:
- Bureau of the Census
- National Bureau of Standards

Department of Health, Education, and Welfare:
- Food and Drug Administration
- Public Health Service
  - National Institutes of Health
  - National Library of Medicine

Department of the Interior:
- Bureau of Mines
- Geological Survey

Other Departments: A number of agencies, especially those of the armed services, issue many technical reports. Many are classified, at least for a time. The Clearinghouse for Federal Scientific & Technical Information serves as a source of information on available (declassified) reports.

Independent Agencies: Some of the independent agencies having publications of interest include the Atomic Energy Commission, the Federal Trade Commission, the General Services Administration, the National Aeronautics and Space Administration, the Tariff Commission, and the Tennessee Valley Authority. A particularly valuable publication of the Atomic Energy Commission is *Nuclear Science Abstracts.*

Locating specific documents may not be easy. From 1895 there is a complete listing in the "Monthly Catalogue of United States Public Documents." The monthly indexes are cumulated annually. A new monthly indexing service is *Government-Wide Index of Federal Research & Development Reports.*

Research and Development Reports

For convenience in ordering, the Superintendent of Documents, U. S. Government Printing Office sells coupons in five-cent denomination.

In a small library a sampling of governmental publications might include examples such as the following:

1. A few annual reports, e.g.,
   - Agricultural Research Service
   - Public Health Service
   - National Bureau of Standards
   - Bureau of Mines
   - Geological Survey
   - Atomic Energy Commission
   - Tariff Commission
2. Lists of publications for the agencies of most interest to the institution having the library. The agencies listed above are good examples.
3. Free price lists for these publications are available and are requested by number. The following are probably of most general interest:

11 Home Economics	46 Soils and Fertilizers
15 Geology	47 Health and Hygiene
37 Tariff and Taxation	58 Mines
38 Animal Industry	62 Commerce
41 Insects	64 Scientific Tests, Standards
43 Forestry	70 Census
44 Plants	84 Atomic Energy

   In these lists a student may find something of interest and send for a copy of the publication.
4. Have the library placed on the mailing list for the biweekly *Selected United States Government Publications.* Many titles are included for new and recent publications, with a brief statement of the contents and price of each.
5. As examples of government documents, obtain a few representative bulletins for students to see.

Thus, *Minerals Yearbook* contains a wealth of information on the production and use of our mineral resources.

Preferably the selections should reflect first the interests of the students and the staff whom the library serves. If these interests are very limited, it would be well to have a few selections for other areas to illustrate what is being done in them.

VIII. SUGGESTED TITLE LIST

Introduction

The books in this list are in the areas of analytical, biochemical, inorganic, organic and physical chemistry. No attempt has been made to include chemical engineering although many titles are applicable to this field. In general, introductory texts have not been included in this list. Opinions differ concerning the desirable availability of these to the student, on the library shelves. In any event, several different and approximately equally useful texts can be identified by a judicious, but almost random, selection of titles from the annual book list published in each September issue of the *Journal of Chemical Education.* Acquisitions in this area probably should be culled and renewed every two or three years, or even oftener. Many libraries will want to have on their shelves the modern secondary school materials prepared by the Chemical Education Material Study (CHEMS) (published by Freeman) and by the Chemical Bond Approach Project (CBA) (published by the Webster Division, McGraw-Hill Book Co.)

The list is arranged alphabetically. Entries are by author or editor unless the work is better known by title, then a SEE reference from author or editor to the title entry is given. Series are listed in parentheses following date of publication. Unless there have been additions or corrections in the re-printing the copyright date has been given.

For each entry the broad classification number from the Dewey Decimal System of Classification is given in parentheses. The number is from the Library of Congress catalog card or from the annual publication "American Scientific Books", 1960- . The classification number is given as a guide in placing books in classification areas.

The prices are taken from publishers' catalogs, brochures, announcements, and the "Cumulative Book Index." For books that are out-of-print, the last price available is given.

Treatises and serial publications which are still being published have an open entry.

The Committee has included a few out-of-print books which it considers important since, to date, there is nothing comparable to them. Frequently, out-of-print books can be located through book dealers. It is hoped that out-of-print books in this list will be reprinted in either hardback or paperback editions. Books in preparation or in press are indicated.

Corrections and suggestions will be appreciated.

SUGGESTED TITLES FOR AN UNDERGRADUATE CHEMISTRY LIBRARY

Adam, Neil Kensington. Physics and chemistry of surfaces. 3d ed. Fair Lawn, N. J., Oxford University Press, 1941. (541) $8.50

Adams, Roger, John R. Johnson and Charles F. Wilcox, Jr. Laboratory experiments in organic chemistry. 5th ed. New York, Macmillan, 1963. (547) $7.95

Adamson, Arthur W. Physical chemistry of surfaces. New York, Interscience, 1960. (541) $12.75

Addison, William Eric. Structural principles in inorganic compounds. New York, Wiley, 1961. (546) $3.25

**Advances in analytical chemistry and instrumentation. Edited by Charles N. Reilley. New York, Interscience, v.1-1960- (543) v.1 $12.00; v.2 $15.00; v.3 $15.00; v.4 $16.00; v.5 in press

**Advances in inorganic chemistry and radiochemistry. Edited by H. J. Emeléus and A. G. Sharpe. New York, Academic Press, v.1-1959- (546) v.1 $14.00; v.2 $14.00; v.3 $14.00; v.4 $11.00; v.5 $14.50; v.6 $16.00; v.7 $15.00

**Advances in organic chemistry: methods and results. Edited by Ralph A. Raphael, Edward C. Taylor, and Hans Wynberg. New York, Interscience, v.1- 1960- (547 v.1 $13.00; v.2 $15.00; v.3 $13.75; v.4 $14.50; v.5 $12.15

** Other Advances in . . . , should be considered for acquisitions when pertaining to areas of interest.

Albert, Adrien and E. P. Serjeant. Ionization constants of acids and bases; a laboratory manual. New York, Wiley, 1962. (541) $4.25

Albertsson, Per Ake. Partition of cell particles and macromolecules; distribution and fractionation of cells, viruses, microsomes, proteins, nucleic acids, and antigen-antibody complexes in aqueous polymer two-phase systems. New York, Wiley, 1960. (547) $7.00

Allen, Harry.C. Jr. and Paul C. Cross. Molecular vib-rotors; the theory and interpretation of high resolution infrared spectra. New York, Wiley, 1963. (535) $13.50

American Chemical Society. Committee on Analytical Reagents. Reagent chemicals; American Chemical Society specifications, 1960. Washington, American Chemical Society, 1961. (543) $10.00

American Chemical Society. Committee on Professional Training. Directory of graduate research, 1965. Washington, American Chemical Society, 1965. (016) $5.00 paperback

American Chemical Society. Division of Chemical Literature. Chemical nomenclature; a collection of papers comprising the symposium on chemical nomenclature . . . New York, Sept. 1951. Washington, American Chemical Society, 1953. (Advances in chemistry series, no. 8) (540) $3.00 paperback

American Chemical Society. Division of Industrial and Engineering Chemistry. Handling and uses of the alkali metals: a collection of papers . . . Washington, American Chemical Society, 1957. (Advances in chemistry series, no. 19) (540) $4.75 paperback

American Chemical Society. Division of Inorganic Chemistry. Free radicals in inorganic chemistry. Papers presented at the symposium on inorganic free radicals and free radicals in inorganic chemistry, 142nd meeting of the American Chemical Society, Atlantic City, N. J., September 10-12, 1962. Washington, American Chemical Society, 1962. (Advances in chemistry series, no. 36) (541) $7.00 paperback

American Institute of Physics. Temperature, its measurement and control in science and industry. New York, Reinhold, 3v. in 5v., 1941-1963. (536) v.1 $11.00; v.2 $12.00; v.3 pt.1 $27.50; v.3 pt.2 $29.50; v.3 pt.3 $22.50

Annual reports on the progress of chemistry. London, The Chemical Society, v.1- 1904- (540) current vol. approx. $6.00

Association of Official Agricultural Chemists. Official methods of analysis. 10th ed. Edited by William Horwitz. Washington, Association of Official Analytical Chemists, 1966. (630) $22.50

Aston, John Geldart and James John Fritz. Thermodynamics and statistical thermodynamics. New York, Wiley, 1959. (536) $9.25

Audrieth, Ludwig Frederick and Jacob Kleinberg. Non-aqueous solvents; applications as media for chemical reactions. New York, Wiley, 1953. (541) $8.50

Azeotropic data; tables of azeotropes and nonazeotropes. Compiled by Lee Herbert Horsley and coworkers at the Dow Chemical Co. Washington, American Chemical Society, 2v., 1952-1962. (Advances in chemistry series, no. 6 & 35) (541) no. 6 $5.00; no. 35 $4.50 paperback

Bailar, John Christian Jr., ed. The chemistry of the coordination compounds. New York, Reinhold, 1956. (American Chemical Society. Monograph Series no. 131) (541) $18.50

Bair, Edward Jay. Introduction to chemical instrumentation; electronic signals and operations. New York, McGraw-Hill, 1962. (McGraw-Hill series in advanced chemistry) (542) $11.50

Baldwin, Ernest. Dynamic aspects of biochemistry. 4th ed. New York, Cambridge University Press, 1963. (574) $7.50

Baldwin, Ernest. An introduction to comparative biochemistry. 4th ed. New York, Cambridge University Press, 1964. (591) $2.95

Ballhausen, Carl Johan. Introduction to ligand field theory. New York, McGraw-Hill, 1962. (McGraw-Hill series in advanced chemistry) (541) $11.75

Barrow, Gordon M. Introduction to molecular spectroscopy. New York, McGraw-Hill, 1962. (539) $11.50

Barrow, Gordon M. Physical chemistry. 2d ed. New York, McGraw-Hill, in press. (541) $9.50

Barrow, Gordon M. The structure of molecules; an introduction to molecular spectroscopy. New York, Benjamin, 1963. (General chemistry monograph series) (544) $4.95; $1.95 paperback

Basolo, Fred and Ronald C. Johnson. Coordination chemistry; the chemistry of metal complexes. New York, Benjamin, 1964. (General chemistry monograph series) (541) $3.95; $1.95 paperback

Basolo, Fred and Ralph G. Pearson. Mechanisms of inorganic reactions; a study of metal complexes in solution. New York, Wiley, 1958. (546) $10.50

Bates, Roger Gordon. Determination of pH; theory and practice. New York, Wiley, 1964. (541) $13.00

Bauman, Robert Poe. Absorption spectroscopy. New York, Wiley, 1962. (535) $12.00

Bell, Ronald Percy. The proton in chemistry. Ithaca, N. Y., Cornell University Press, 1959. (The George Fisher Baker non-resident lectureship in chemistry at Cornell University, 1958) (541) $6.75

Bellamy, L. J. The infra-red spectra of complex molecules. 2d ed. New York, Wiley, 1958. (535) $9.50

Benfey, Otto Theodor. From vital force to structural formulas; the development of ideas in organic chemistry. Boston, Houghton Mifflin, 1964. (Classic researches in organic chemistry series) (547) $1.95 paperback

Bennett, Harry, ed. The chemical formulary; a collection of valuable, timely, practical commercial formulae and recipes for making thousands of products in many fields of industry. New York, Chemical Pub. Co., v.1- 1933- . Cumulative index 1-10. (660) $11.00 per vol.

Bennett, Harry, ed. Concise chemical and technical dictionary. 2d enl. ed. New York, Chemical Pub. Co., 1962. (540) $15.00

Benson, Sidney William. The foundations of chemical kinetics. New York, McGraw-Hill, 1960. (McGraw-Hill series in advanced chemistry) (541) $14.50

Bent, Henry A. Second law; an introduction to classical and statistical thermodynamics. Fair Lawn, N. J., Oxford University Press, 1965. (536) $6.00

Berl, Walter George, ed. Physical methods in chemical analysis. 2d rev. ed. New York, Academic Press, 4v., 1960- (544) v.1 $19.00; v.2 in preparation; v.3 (1st ed.) $18.00; v.4 (1st ed.) $16.00

Bernfeld, Peter, ed. Biogenesis of natural compounds. New York, Pergamon Press, 1963 (547) $28.00

Bhacca, Norman S., D. P. Hollis, L. F. Johnson, and E. A. Pier. NMR spectra catalog. Palo Alto, Calif., Instrument Division of Varian Associates, 1962- (539) v.1-2 $10.00 each, $5.00 each spiral binding

Biemann, Klaus. Mass spectrometry; organic chemical applications. New York, McGraw-Hill, 1962. (McGraw-Hill series in advanced chemistry) (547) $14.50

Biochemical preparations. New York, Wiley, v.1- 1949- (612) v.1 $5.00; v.2 $5.00; v.3 $5.00; v.4 $5.50; v.5 $6.00; v.6 $6.50; v.7 $6.50; v.8 $7.00; v.9 $6.95; v.10 $9.75

Bjerrum, Jannik and Gerold Schwartzenbach. SEE Sillén, Lars Gunnar and Arthur E. Martell

Blaedel, Walter John and Vulliers Wilson Meloche. Elementary quantitative analysis; theory and practice. 2d ed. New York, Harper & Row, 1963. (545) $9.60

Block, Richard J., Emmett L. Durrum and Gunter Zweig. Manual of paper chromatography and paper electrophoresis. 2d ed. rev. and enl. New York, Academic Press, 1958. (544) $15.00

Bobbitt, James M. Thin-layer chromatography. New York, Reinhold, 1963. (547) $8.50

Bockris, John O'Mara, ed. Modern aspects of electrochemistry. Washington, Butterworth, No. 1- 1954- (Modern aspects of chemistry series) (541) no. 1 $6.80; no. 2, 1963 reprint, $13.00; no. 3 $17.75

Bohm, David. Quantum theory. Englewood Cliffs, N. J., Prentice-Hall, 1951. (Prentice-Hall physics series) (530) Text $9.50

Born, Max. Atomic physics. 7th ed. London, Blackie, 1962; New York, Hafner Publishing Co. (539) $7.50

Bowen, Edmund John. The chemical aspects of light. 2d ed. rev., Fair Lawn, N. J., The Clarendon Press, 1949. (535) $5.00

Boyer, Paul D., Henry Lardy and Karl Myrbäck, eds. The enzymes. 2d ed., completely rev. New York,

Academic Press, v.1-8 1959-1963. (612) v.1 $24.00; v.2 $16.00; v.3 $16.00; v.4 $18.00; v.5 $20.00; v.6 $20.00; v.7 $21.00; v.8 $16.50

Boyle, Robert. Sceptical chymist. (London, J. M. Dent & Sons, Ltd.) New York, Dutton, 1911. (Everyman's library standard edition, no. 559) (540) $2.25

Bragg, Sir Lawrence, ed. The crystalline state—v.1, A general survey, by Sir Lawrence Bragg; v.2, The optical principles of the diffraction of X-rays, by R. W. James; v.3, The determination of crystal structures, by H. Lipson and W. Cochran; v.4, Crystal structures of minerals, by Sir Lawrence Bragg and G. F. Claringbull. London, G. Bell, 4v., 1949- (548) v.1, reprinted with corrections 1949, 45s.; v.2, 1962 reprint with addendum, 84s.; v.3, new rev. ed. in preparation; v.4, 1965, about 70s.

Brand, John Charles Drury and James Clare Speakman. Molecular structure: the physical approach. London, E. Arnold, 1960; New York, U. S. Agent—St. Martin's Press. (541) $6.50

Braude, Ernest Alexander and Frederick C. Nachod, eds. Determination of organic structures by physical methods. New York, Academic Press, 2v., 1955-1962. (v.2 edited by Frederick C. Nachod and W. D. Phillips) (541) v.1 $18.00; v.2 $18.00

Brauer, Georg, ed. SEE Handbook of preparative inorganic chemistry

Bray, Alexander. Russian-English scientific-technical dictionary. New York, International Universities Press, 1945. (603) $10.00

Breslow, Ronald. Organic reaction mechanisms; an introduction. New York, Benjamin, 1965. (Organic chemistry monograph series) (547) $8.00; $3.95 paperback

Brillouin, Léon. Science and information theory. 2d ed. New York, Academic Press, 1962. (519) $9.00

Brown, George Ingham. A simple guide to modern valency theory. New York, Wiley, 1953. (541) $3.50

Brown, Herbert Charles. Hydroboration. New York, Benjamin, 1962. (547) $12.50

Budzikiewicz, Herbert, Carl Djerassi and Dudley H. Williams. Interpretation of mass spectra of organic compounds. San Francisco, Holden-Day, 1964. (547) $10.50

Buerger, Martin Julian. Elementary crystallography; an introduction to the fundamental geometrical features of crystals. Rev. printing. New York, Wiley, 1963. (548) $11.95

Buerger, Martin Julian. X-ray crystallography; an introduction to the investigation of crystals by their diffraction of monochromatic x-radiation. New York, Wiley, 1942. (548) $10.95

Bunn, Charles William. Chemical crystallography; an introduction to optical and x-ray methods. 2d. ed. Fair Lawn, N. J., Oxford University Press, 1961. (548) $12.00

Butler, James Newton. Ionic equilibrium; a mathematical approach. Reading, Mass., Addison-Wesley, 1964. (Addison-Wesley series in chemistry) (541) $8.75

Cahn, Robert S. An introduction to chemical nomenclature. 2d ed. Washington, Butterworth, 1964. (540) $2.50 paperback

Callaham, Ludmilla Ignatiev. Russian-English chemical and poly-technical dictionary. 2d ed. New York, Wiley, 1962. (540) $19.50

Calvin, Melvin, Charles Heidelberger, James C. Reed, Bert M. Tolbert and Peter E. Yankwich. Isotopic carbon: techniques in its measurement and chemical manipulation. New York, Wiley, 1949. (546) $12.50

Campbell, J. Arthur. Why do chemical reactions occur? Englewood Cliffs, N. J., Prentice-Hall, 1965. (541) $4.50; $1.50 paperback

Cartmell, Edward and Gerald W. A. Fowles. Valency and molecular structure. 2d ed. Washington, Butterworth, 1961. (541) $7.00

Cason, James and Henry Rapoport. Laboratory text in organic chemistry. 2d ed. Englewood Cliffs, N. J., Prentice-Hall, 1962. (547) $7.95

Castellan, Gilbert W. Physical chemistry. Reading, Mass., Addison-Wesley, 1964. (541) $12.50

Chargaff, Erwin and James Norman Davidson, eds. The nucleic acids: chemistry and biology. New York, Academic Press, 3v., 1955-1960. (547) v.1 $19.00; v.2 $17.00; v.3 $18.00

Charlot, Gaston, J. Badoz-Lambling and B. Trémillon. Electrochemical reactions; the electrochemical methods of analysis. New York, American Elsevier, 1962. (545) $15.00

Chemical engineers' handbook. 4th ed. Edited by Robert H. Perry, Cecil H. Chilton, and Sidney D. Kirkpatrick. New York, McGraw-Hill, 1963. (McGraw-Hill series in chemical engineering) (660) $29.50

The Chemistry of heterocyclic compounds; a series of monographs. Arnold Weissberger, consulting ed. New York, Interscience, v.1- 1950- (547) price per vol. varies

Cheronis, Nicholas D., John B. Entrikin and Ernest M. Hodnett. Semimicro qualitative organic analysis; the systematic identification of organic compounds. 3d ed. New York, Interscience, 1965. (547) $29.50

Choppin, Gregory R. Experimental nuclear chemistry. Englewood Cliffs, N. J., Prentice-Hall, 1961 (Prentice-Hall chemistry series) (541) $11.35

Clark, William Mansfield. Oxidation-reduction potentials of organic systems. Baltimore, Williams & Wilkins, 1960. (547) $13.50

Clifford, Alan F. Inorganic chemistry of qualitative analysis. Englewood Cliffs, N. J., Prentice-Hall, 1961. (Prentice-Hall chemistry series) (544) $7.95

Coates, Geoffrey Edward. Organo-metallic compounds. 2d ed., rev. New York, Wiley, 1960. (547) $7.50

Coffey, S., ed. SEE Rodd

Cohn, Edwin Joseph and John T. Edsall. Proteins, amino acids, and peptides as ions and dipolar ions. New York, Reinhold, 1943. (American Chemical Society. Monograph Series, no. 90) (547) $13.50

Colowick, Sidney P. and Nathan O. Kaplan, eds. Methods in enzymology. New York, Academic Press, 7v., 1955-1964. (612) v.1 $19.00; v.2 $20.80; v.3 $26.00; v.4 $24.00; v.5 $28.00; v.6 $28.00; v.7 $14.00

Companion, Audrey L. Chemical bonding. New York, McGraw-Hill, 1964. (541) $4.50; $1.95 paperback

Conant, James Bryant. On understanding science; an historical approach. New Haven, Yale University Press, 1947. (The Terry lectures) (507) $2.00

Condon, Edward U. and Hugh Odishaw, eds. SEE Handbook of physics

Condon, Edward U. and G. H. Shortley. The theory of atomic spectra. New York, Cambridge University Press, 1935 (reprinted in 1953 with corrections). (539) $12.50; $3.95 paperback

Condoyannis, George Edward. Scientific German, a concise description of the structural elements of scientific and technical German. New York, Wiley, 1957. (438) $3.75 paperback

Condoyannis, George Edward. Scientific Russian, a concise description of the structural elements of scientific and technical Russian. New York, Wiley, 1959. (491) $3.50 paperback

Conn, Eric E. and Paul Karl Stumpf. Outlines of biochemistry. New York, Wiley, 1963. (574) $9.25

Cook, James. W., ed. SEE Progress in organic chemistry

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